EPA

San Fernando Valley Superfund Sites

Region IX, San Francisco | March 1993 | Fact Sheet Number 10

EPA ANNOUNCES RESULTS OF BASINWIDE GROUNDWATER REMEDIAL INVESTIGATION

Introduction

The U.S. Environmental Protection Agency (EPA) announces the availability of two reports on the groundwater contamination in the San Fernando Valley: 1) Remedial Investigation Report of Groundwater Contamination in the San Fernando Valley and 2) the Report for First and Second Quarter Sampling, 1992, of the San Fernando Groundwater Monitoring Program. This fact sheet describes the important findings of the two reports. The reports are available for review at the information repositories listed on page 11 of this fact sheet.

The Remedial Investigation (RI) report presents the results of investigations to identify and characterize **groundwater** contamination throughout the eastern San Fernando Valley. The comprehensive five-volume report, a product of EPA's **Remedial Investigation/Feasibility Study (RI/FS)** to investigate and clean up contamination for the San Fernando Valley **Superfund** project, includes data from groundwater investigations through 1991.

EPA is continuing to monitor the groundwater in the San Fernando Valley. The Report for First and Second Quarter Sampling, 1992 of the San Fernando Groundwater Monitoring Program report provides an updated information supplement to the Remedial Investigation Report.

Background

The San Fernando Valley Superfund sites are located in the eastern end of the San Fernando Valley, between the San Gabriel and Santa Monica Mountains. The San Fernando Valley is an important source of drinking water for the Los Angeles metropolitan area, including the Cities of Los Angeles, Glendale, Burbank and San Fernando, La Cañada-Flintridge, and the unincorporated area of La Crescenta-Montrose.

In 1980, after finding organic chemical contamination in the groundwater of the San Gabriel Valley, the California Department of Health Services (DHS) requested all major groundwater users to conduct tests for the presence of certain industrial chemicals in the water they were serving. The results of testing revealed the presence of **volatile organic compound (VOC)** contamination in the groundwater beneath large areas of the San Fernando Valley. The primary contaminants of concern are the solvents **trichloroethylene (TCE)** and **perchloroethylene (PCE)**, widely used in a variety of industries including dry cleaning, metal plating, and machinery degreasing.

State and local agencies provided alternative water supplies while beginning the investigation and cleanup of potential sources of con-

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IF YOU WOULD LIKE YOUR OWN COPY OF THE BASINWIDE REMEDIAL INVESTIGATION REPORT

The Basinwide Remedial Investigation Report can be purchased at OCB Reprographics in Irvine, California. Volume 1 consists of the findings and the analysis characterizing the groundwater of the San Fernando Valley, while Volumes 2 through 5 are data appendices. You can purchase Volume 1 only or all five volumes at a cost of $374.59 or $878.56, respectively. There is a discounted rate for 21 or more copies. Please call or visit OCB Reprographics to order your copy of the report.

OCB Reprographics
17721 Mitchell North
Irvine, CA 92714
(714) 660-1150
Contact: Grant Kiger

Terms in **bold** are defined in the glossary on page 9.

Background Continued from page 1

tamination. EPA and other agencies became involved in coordinating efforts to address the large-scale contamination. In 1984, EPA proposed four sites for inclusion on the **National Priorities List (NPL)**: North Hollywood, Crystal Springs, Pollock and Verdugo. In 1986, the four sites were included on the NPL. EPA manages the four sites and adjacent areas where contamination has or may have migrated as one large site called the **San Fernando Valley Superfund Site** (Figure 1). In 1987, EPA and the Los Angeles Department of Water and Power (LADWP) signed a Cooperative Agreement providing federal funds to perform an RI of groundwater contamination in the San Fernando Valley. EPA is coordinating the large-scale effort for groundwater monitoring and the basinwide groundwater Feasibility Study (FS).

EPA has identified five operable units (OUs) within the San Fernando Valley Superfund Site to address specific areas of contamination that require prompt remedial actions. Each OU represents a discrete, interim cleanup currently in progress throughout the eastern portion of the San Fernando Basin. EPA has signed **Record of Decision (ROD)** documents for two OUs in the San Fernando Valley: North Hollywood OU (1987) and Burbank OU (1989). The North Hollywood OU Interim Remedy is currently operating and the Burbank OU is in the remedial design phase. In the Glendale area, EPA has issued two Proposed Plans: one for Glendale North OU and one for Glendale South OU. A Remedial Investigation for a fifth OU has been initiated in the Pollock area. All **remedial actions** established by EPA in the RODs or proposed plans issued to date are interim measures but are intended to be consistent with the overall long-term remediation of the San Fernando Valley.

Through a cooperative agreement, EPA provides partial funding to the Los Angeles Regional Water Quality Control Board (RWQCB) for the State's Well Investigation Program. Through this program, the RWQCB identifies industries and facilities that may have caused or contributed to groundwater contamination and oversees facility-specific cleanup efforts.

Local water suppliers and state agencies assure that drinking water meets all state and federal standards. Drinking water is tested regularly before it is delivered to consumers. **Public drinking water in the San Fernando Valley Basin area is safe to drink.**

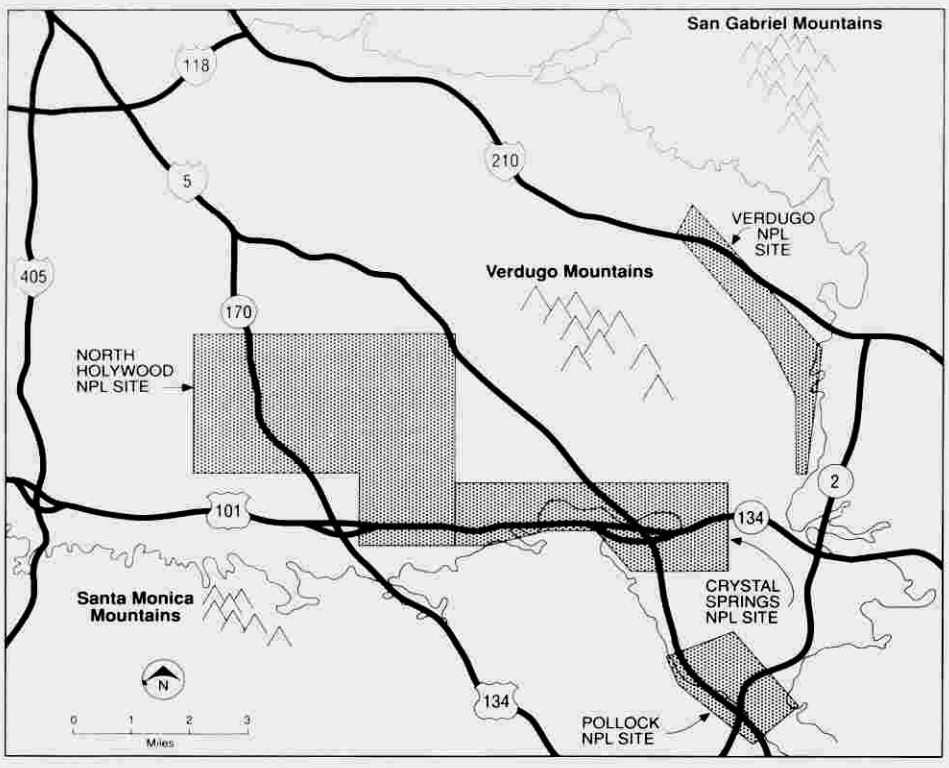


Figure 1. San Fernando Valley Superfund Site.

How Was The Remedial Investigation Data Obtained?

Understanding the geology, groundwater and extent of contamination in the San Fernando Valley is a complex task. An initial conceptual model was developed for the San Fernando and Verdugo basins of the San Fernando Valley, using existing water quality data and information such as reports from well drillers, to guide the field investigation and computer modeling of the groundwater. The field investigation for the RI began with a soil gas survey to initially locate the existing VOC groundwater contamination. The field investigation

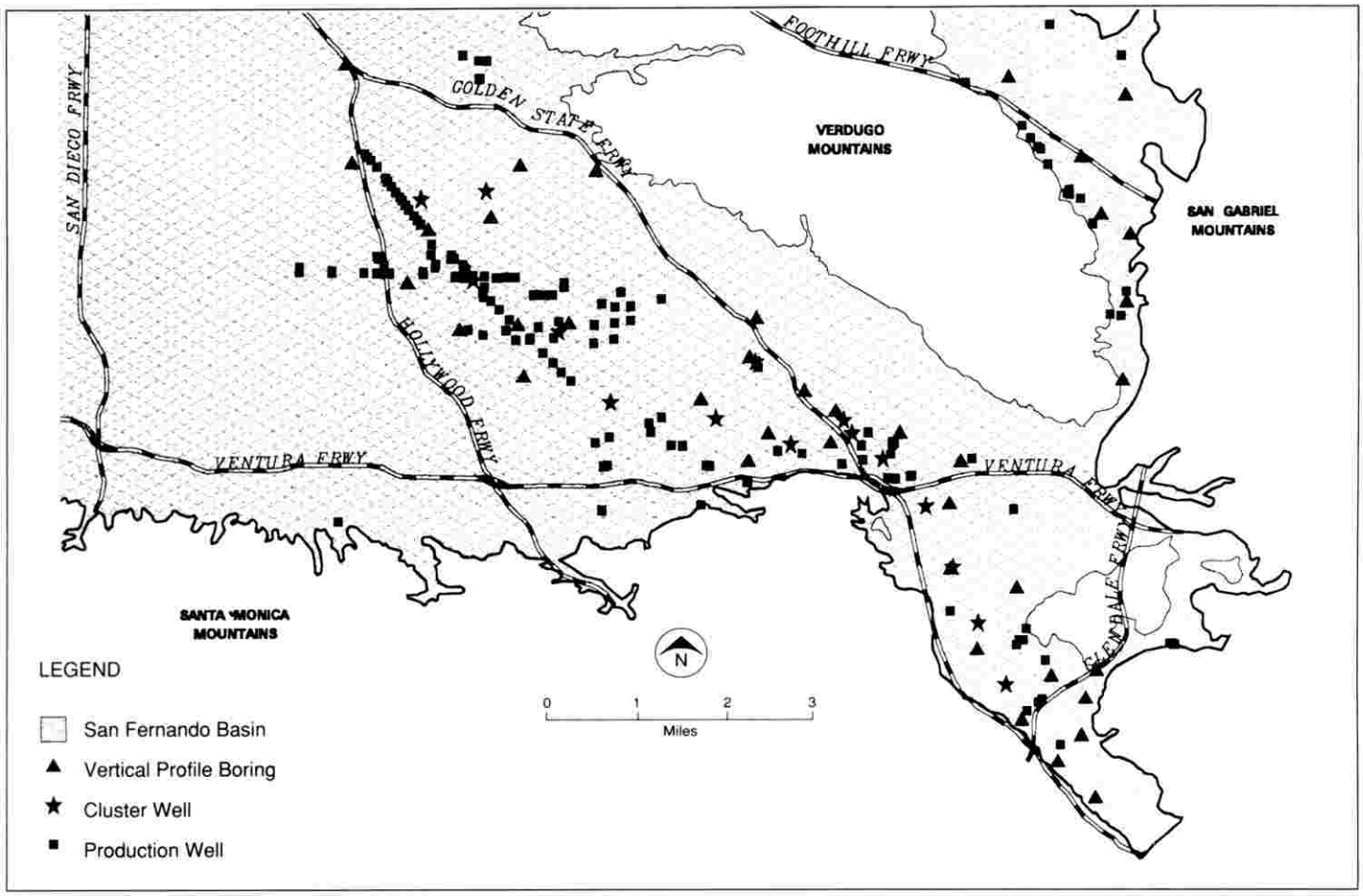


Figure 2. Location of RI and Production Wells

continued with extensive groundwater monitoring well installation, sampling and laboratory analysis to provide more focused data. This information was used by EPA and LADWP to determine the extent of contamination and refine our understanding of the geology and hydrogeology of the San Fernando Valley. Soils were also collected and analyzed during the drilling of the monitoring wells for additional information on contaminants in the soil and the geology of the contaminated areas.

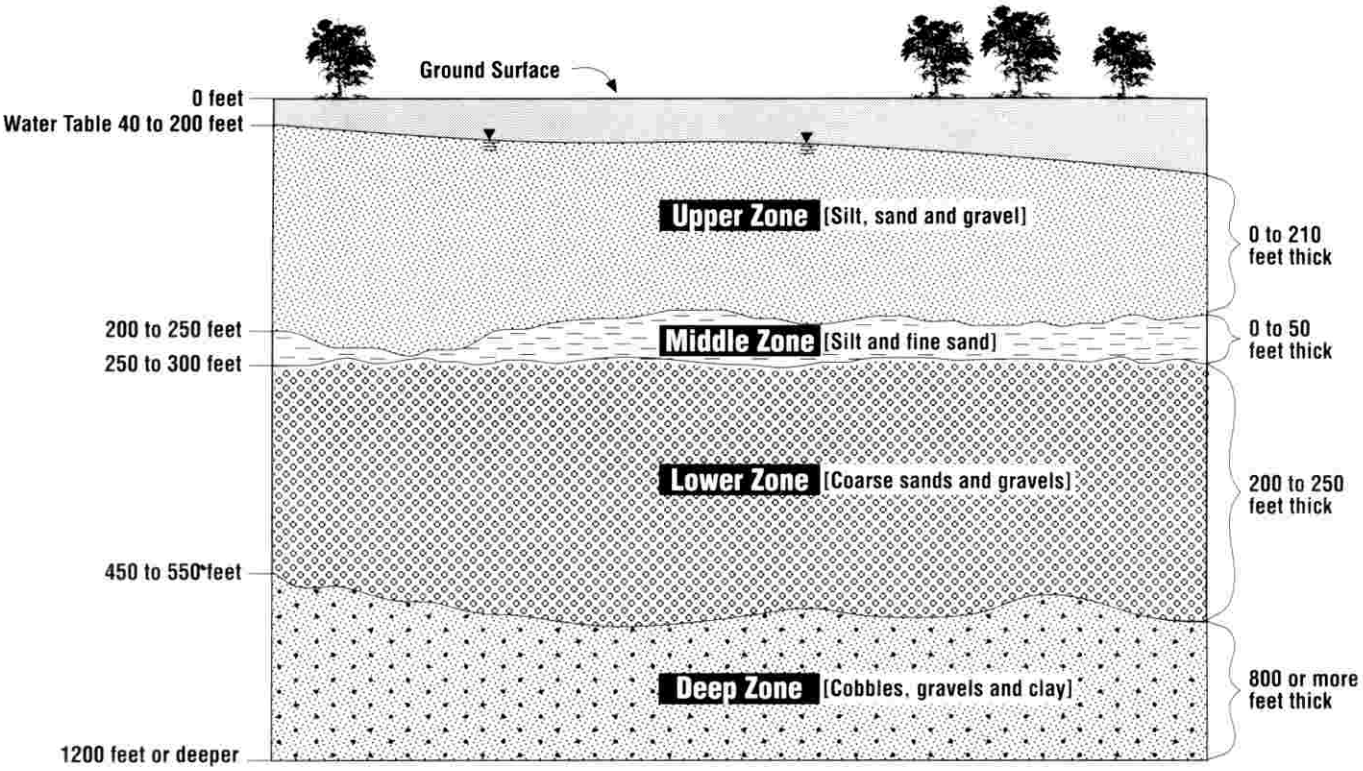
Locations of wells used to collect data for the RI are shown on Figure 2. Three types of groundwater wells were used in the RI: drinking water supply wells, vertical profile borings (shallow wells), and cluster wells.

Drinking Water Supply Wells ■ Existing drinking water wells (**production wells**) are sampled regularly to ensure that drinking water meets federal and state standards. Information from well drillers' reports was used to assess the geologic and hydrogeologic features of the San Fernando Valley. Data from existing water supply wells were included in the RI to provide current and historical water quality information. EPA continues to receive water supply well information to supplement its groundwater monitoring program. Because each production well typically draws water from a range of depths (45 feet to 1000 feet below the surface), the contaminant concentrations in these wells represent a composite or mixture of the concentrations at the different depths.

Vertical Profile Borings (VPBs) ■ Monitoring wells, called **vertical profile borings**, were constructed to sample and analyze groundwater in the shallow aquifer where the highest contaminant concentrations are generally found. Groundwater samples are obtained from a specific depth interval (10 to 20 feet thick) to estimate the areal extent of contamination in the upper aquifer zone. Between May 1989 and January 1990, 43 VPBs were completed near the water table at depths ranging from 45 to 376 feet below ground surface.

Cluster Wells ■ After the VPB installation and sampling, **cluster wells** were installed in areas of high contamination to better define the vertical extent of contamination. Each cluster well is

Figure 3. Geologic Zones in the San Fernando Basin



Four geologic zones are located in the San Fernando Valley Groundwater Basin. The zones are believed to be present over much of the eastern San Fernando Basin, but may not necessarily occur at any specific location.

typically composed of two to four monitoring wells installed closely together, with each well perforated (screened) to sample at a different specific depth. Fifteen sets of cluster wells, totalling 44 wells, were constructed between March 1990 and September 1990 at depths ranging from 52 to 800 feet below ground surface to collect data for the RI. Detailed geologic and hydrogeologic information was collected during construction of the deepest well in each cluster.

Most of the 87 monitoring wells and 19 previously existing monitoring or production wells were sampled again during 1991 to augment the earlier data. These RI monitoring wells have now been incorporated into EPA's quarterly sampling program to monitor changes of contaminant concentrations in the basin. EPA's groundwater monitoring program is ongoing. The wells most critical to tracking the contamination (currently 41 wells) are sampled every quarter (January, April, July and October) and analyzed for VOCs and nitrate. Each year, all EPA wells are sampled and analyzed for a full range of possible contaminants. EPA also performs specialized sampling and analyses as the need arises. Water quality information from local water suppliers and private facility monitoring wells, completed under the jurisdiction of state agencies, is collected to supplement EPA's monitoring data. The analytical results and the associated **plume** maps are compiled in a report twice a year. EPA estimates that the next monitoring report will be issued in April 1993.

Remedial Investigation Results

The Basinwide Remedial Investigation Report describes the results of more than five years of investigation of groundwater contamination in the San Fernando and Verdugo Basins through 1991. This is one of the largest projects of its kind in size and complexity in the United States. Objectives of the investigation were to: (1) characterize the geology and hydrogeology of the groundwater basins, (2) develop a groundwater flow model of the basin; (3) determine the nature and extent of groundwater contamination, (4) identify the fate and transport of compounds in the environment, (5) evaluate potential health risks, and (6) identify preliminary **applicable or relevant and**

appropriate requirements (ARARs), which are federal or more stringent state laws that would need to be met or waived for the final basinwide groundwater cleanup.

GEOLOGY AND HYDROGEOLOGY

Understanding the geology (how the soils and rocks are arranged) and hydrogeology (how water moves through the ground) is important to understanding how the contamination is moving in the San Fernando Basin and how it can be contained or cleaned up. The information from soil borings, monitoring wells, and other studies used to develop the RI indicate there are generally four geologic zones or layers (Deep, Lower, Middle, and Upper) in the basin. The depth and thickness of these zones depends on the location within the basin. The zones are believed to be present over much of the eastern San Fernando Basin, but the composition and characteristics of each zone may vary at any specific location. The relative depth and thickness of the zones are shown in Figure 3.

The Deep Zone extends to the bedrock at a depth of at least 1,200 feet below ground surface within the deepest portions of the eastern San Fernando Basin. The Deep Zone is not presently an important source for water supply. Evidence suggests that there is little interaction between the Deep Zone and contaminated portions of the aquifer. The Lower Zone, which lies above the Deep Zone, is composed of coarse sands, gravels, and cobbles. The top of the Lower Zone occurs approximately 250 feet below ground surface and the Lower Zone is approximately 200 to 250 feet thick. Most of the production wells in the eastern San Fernando Basin are perforated in the upper portions of the Lower Zone. The Middle Zone overlies the Lower Zone and is characterized by a sequence of fine-grained sands, silts and clays. The thickness of the Middle Zone is 0 to 50 feet. The Upper Zone is composed of silt, sand, and gravel and reaches from the surface to 200 to 250 feet below the ground surface. Because the groundwater varies from less than 40 feet below the ground surface (in the southeast) to greater than 200 feet below the ground surface in North Hollywood, only a portion of the Upper Zone may contain groundwater. Relatively little water supply is produced from the Upper and Middle Zones.

Under natural conditions, groundwater flows east across the valley in the western portion of the basin and to the southeast in the east portion toward the Los Angeles River Narrows. However, groundwater flow patterns are influenced by groundwater pumping for water supply. The direction of flow near these wells can change seasonally because the supply wells typically are pumped most heavily during the summer months. When water is being pumped from the Lower Zone, groundwater can be drawn downward through the Upper and Middle Zones. When the wells are not pumping from the Lower Zone and water levels recover, groundwater generally flows horizontally.

NATURE AND EXTENT OF CONTAMINATION

Groundwater samples have been collected from production (drinking supply) and monitoring wells throughout the San Fernando Valley. Sufficient data exist to identify contaminant distributions in the Upper and Lower

TABLE 1
VOCs DETECTED ABOVE MAXIMUM CONTAMINANT LEVELS (MCLs)

	Federal MCL (in parts per billion)	State MCL (in parts per billion)
Volatile Organic Compounds		
Benzene	5	1
1,1-Dichloroethane	—	5
1,2-Dichloroethane	5	0.5
1,1-Dichloroethene	7	6
1,2-Dichloroethene (total)	5	0.5
1,2-Dichloropropane	5	5
Carbon Tetrachloride	5	0.5
1,1,2,2-Tetrachloroethane	—	1
Tetrachloroethene (PCE)	5	5
1,1,1-Trichloroethane	200	200
Trichloroethene (TCE)	5	5

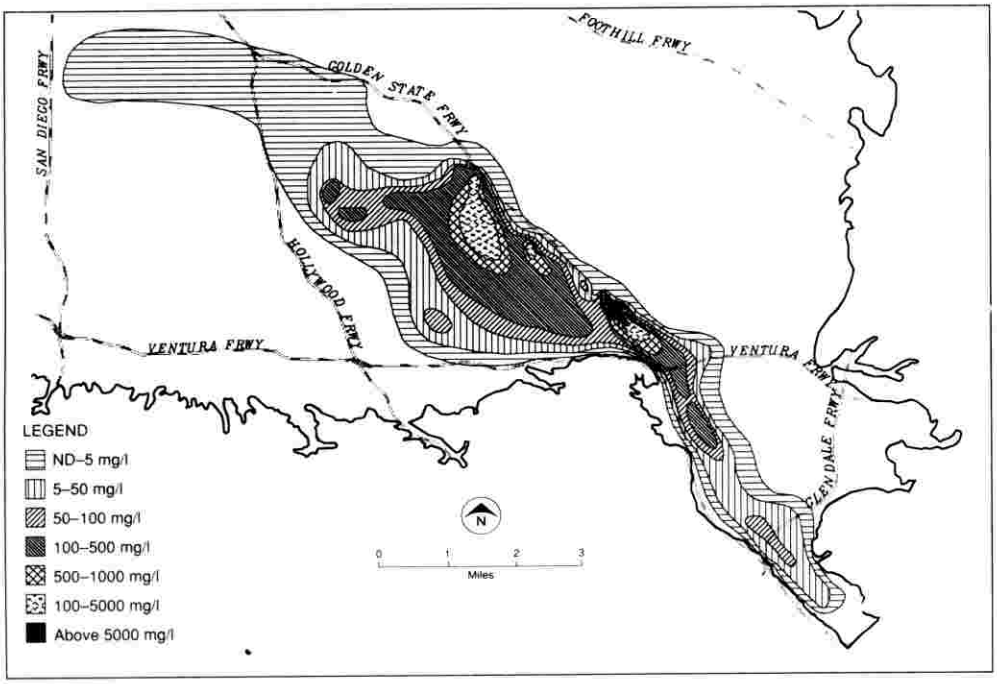


Figure 4A. Areas of TCE contamination in Upper Zone in 1992

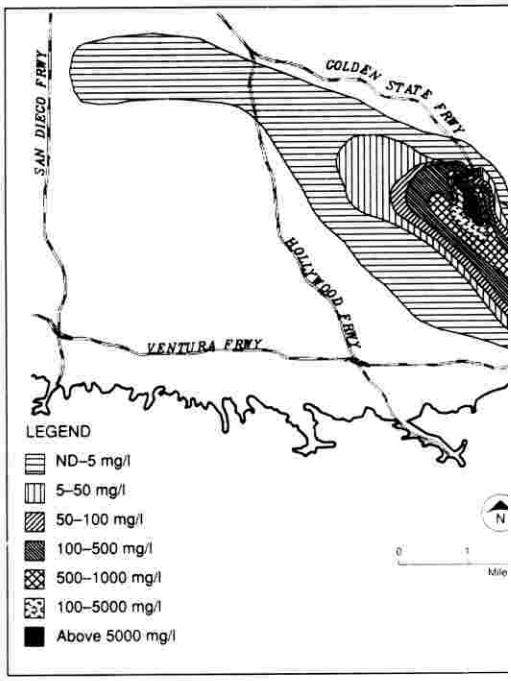


Figure 4B. Areas of PCE contamination in Upper

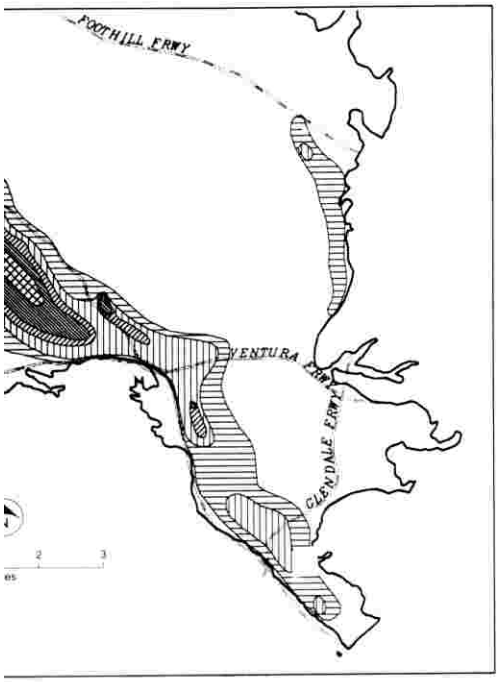
Zones. No monitoring wells were screened exclusively in the Middle Zone, and therefore, the distribution of contamination in this zone was not evaluated. EPA samples and analyzes the groundwater for volatile organic compounds (VOCs), semi-volatile organic compounds, metals, radionuclides, nitrate, and other chemicals. The predominant contaminants in the groundwater of the San Fernando Basin are VOCs, particularly trichloroethylene (TCE) and perchloroethylene (PCE), and nitrate. Table 1 on Page 5 shows the chemicals detected at least once in the San Fernando Valley above drinking water standards.

The majority and highest concentration of contamination in the groundwater was found in the Upper Zone, where 11 of the 34 VOCs analyzed were detected above their respective **maximum contaminant levels (MCLs)** during the 1991 sampling event. Only four of the 11 VOCs detected above their respective MCLs in the Upper Zone were also detected in the Lower Zone, and no VOCs were detected in the Lower Zone that were not also detected in the Upper Zone. In the Lower Zone, groundwater contamination appeared to be present in smaller, more isolated areas. No VOC contamination was detected in wells screened in the Deep Zone.

TCE, PCE and nitrate are the most widespread contaminants. Other contaminants, particularly other VOCs, have generally been found in areas of high PCE and TCE contamination. Concentrations are generally higher in the Upper Zone than in the Lower Zone. The highest concentration of TCE detected in EPA wells in 1992 was 7,100 **parts per billion (ppb)** or 1,420 times the drinking water standard. PCE in the EPA wells in 1992 was detected as high as 160 ppb, or 32 times the standard. Groundwater samples from wells installed at industry facilities in the San Fernando Valley near potential sources of contamination, have shown concentrations greater than 30,000 ppb for TCE and over 15,000 ppb for PCE.

In addition to VOCs, two priority pollutant metals, chromium and lead, were detected above their respective MCLs at some locations within the Upper Zone during the 1991 RI sampling. However, EPA is currently investigating the possibility that the metals are a result of drilling and sampling techniques, not actual groundwater contamination. No metals were detected above their MCLs within the Lower and Deep Zones. Nitrate was detected above its MCL in the Upper Zone and in isolated areas in the Lower and Deep Zones.

As part of the RI, plume maps showing the extent of PCE, TCE, and nitrate contamination in the Upper and Lower Zones were developed using RI well and depth-specific industry well data. Figures 4-A, 4-B, and 4-C above show TCE, PCE, and nitrate plumes for the Upper Zone based on 1992 data. Groundwater in the Upper Zone with



r Zone in 1992

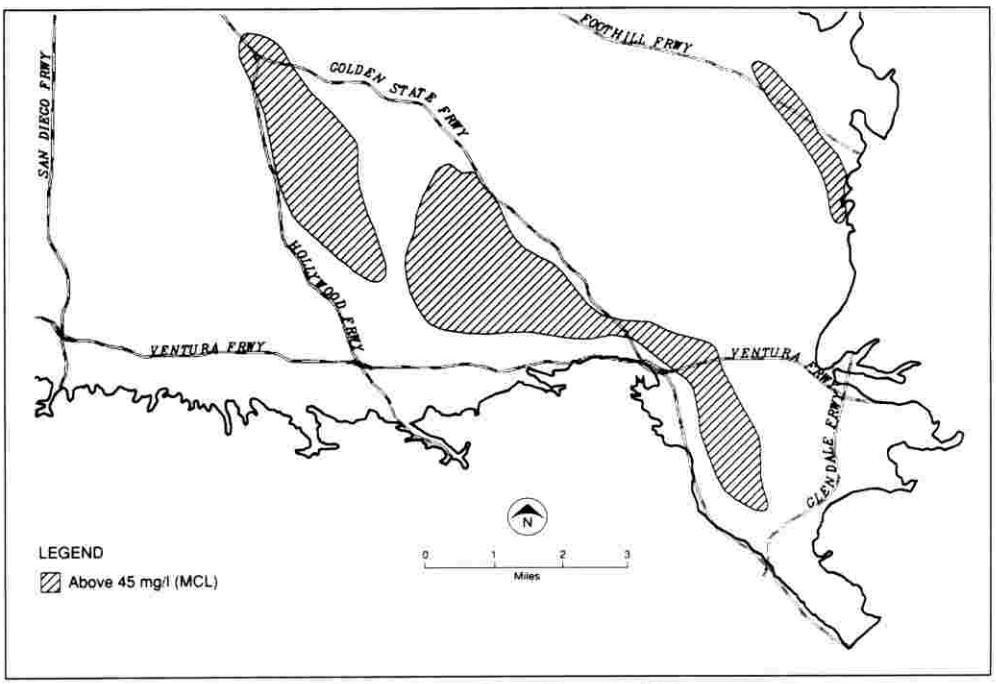


Figure 4C. Areas of Nitrate contamination in Upper Zone in 1992

TCE concentrations exceeding the drinking water standard underlies approximately 13 square miles of the basin and is interspersed with "hot spots," areas of higher contamination. The PCE plume is similar in shape to the TCE plume, but is smaller in extent (about nine square miles).

SAN FERNANDO BASIN GROUNDWATER FLOW MODEL

As part of the Basinwide Remedial Investigation, LADWP developed a three-dimensional groundwater flow model of the San Fernando Basin. The groundwater model of the San Fernando Basin was developed to meet these goals:

- Assess and confirm the groundwater conditions of the San Fernando Basin
- Evaluate past and future contaminant migration
- Predict and evaluate the basin-wide effects of potential remedial actions.

The computerized model represents the known and estimated components of the basin such as the hydrogeologic zones, groundwater flow directions, and the balance of groundwater inflows and outflows. By combining information about conditions in the basin with mathematical formulas to describe changes in those conditions, the model can help identify areas to target for field investigations, and predict future movement of contamination. This groundwater flow model will be continually updated, refined and improved by EPA as new information becomes available.

The model was calibrated by comparing results from computer simulations against actual water levels measured in the basin. The parameters of the model were adjusted until the differences between the model's results and the measured values met specified tolerances. Generally, the water levels and flow patterns generated by the model compare favorably with those derived from actual well data. The model simulates observed, regional flow directions and simulates both the steep cones of depression caused by pumping and the relatively flat gradients produced by recovering water levels in most areas in the eastern portion of the basin.

As the model was developed, it was used to guide RI work and OU feasibility studies. The model will help EPA evaluate past and future contaminant migration and remediation efforts in the groundwater basin.

FATE AND TRANSPORT

Once contaminants have reached the groundwater, their migration throughout the San Fernando Basin is controlled primarily by groundwater flow. Groundwater flows in complex patterns around the solid particles underground, although the overall flow may be in a single direction. The flow patterns can result in the spreading (dispersion) of contaminants carried with the groundwater. Physical and chemical reactions between some contaminant compounds

and the soil particles can slow down (retard) the average flow of contaminants, and may trap the compounds temporarily or permanently.

Neither chemical nor biological destruction are expected to have an important effect on the ultimate fate of the major contaminants in the San Fernando Valley. Most compounds will remain in the groundwater until they are pumped from wells or migrate with the groundwater through the Los Angeles River Narrows.

The RI estimated the average rates of TCE, PCE, and nitrate migration from the estimated velocity of groundwater flow and the estimated effects of physical retardation (entrapment on soil particles). Retardation has the effect of slowing the average TCE and PCE migration to velocities approximately one half to one third the velocity of the groundwater. Nitrate migration does not appear to be affected by physical retardation.

The average groundwater velocity is estimated to vary from about 300 feet per year in the North Hollywood area to over 1,300 feet per year in the Los Angeles River Narrows. Local pumping conditions may have a strong effect on the horizontal and vertical movement of groundwater and the transport of contaminants.

Existing wells in the basin that are perforated across several zones (such as the Upper and Lower Zones) may provide potential pathways for vertical contaminant migration, especially in areas where groundwater extraction in the Lower Zone occurs.

HEALTH RISK ASSESSMENT

As part of the Basinwide Remedial Investigation, LADWP prepared a "Baseline Risk Assessment" for the compounds detected in the San Fernando Basin that exceeded MCLs. The purpose of the risk assessment was to evaluate potential health effects from exposure to contaminated groundwater. The results of the risk assessment help EPA determine if any remedial actions are necessary to protect human health or the environment. The risk assessment examined the potential health effects if individuals were exposed to contaminated groundwater from the Upper and Lower Zones of the eastern San Fernando Basin (i.e., if it were to be used as a source of drinking water without treatment). In preparing risk assessments, EPA uses very conservative assumptions that weigh in favor of protecting public health.

The results of the risk assessment indicated contaminant levels in the Upper Zone of the aquifer would pose an unacceptable cancer risk (potentially greater than 1 in 1,000) to human health if this water were delivered directly to local residents *without* treatment. However, it should be reiterated that ***no one is drinking contaminated water.*** The RI presents the details of the risk assessment analysis.

What Happens Next?

EPA is currently using the results of the remedial investigation to perform basinwide feasibility studies to address VOC contamination in both the groundwater and soil above the groundwater (**vadose zone**) of the eastern portion of the San Fernando Valley.

As part of the basinwide groundwater feasibility study, EPA is revising and recalibrating the basinwide groundwater flow model to incorporate the most recent data. The updated version of the model will be complete in early 1993. EPA will use the revised model to conduct a no-further-action analysis to determine what would occur if no basinwide groundwater cleanup action were undertaken. EPA will also evaluate the effectiveness of currently operating and planned OUs in facilitating the cleanup of the regional groundwater plume and limiting further spread of the most contaminated areas.

EPA will then review and evaluate various groundwater remediation options including: regional pump and treat, well-head treatment, and use of innovative technologies.

TECHNICAL ASSISTANCE GRANTS (TAGs) PROGRAM

Under this program, one eligible community group at each Superfund site may obtain one grant of up to $50,000 in federal funds to provide technical assistance in understanding site documents. To be eligible, a group must:

- **Incorporate**
- **Meet a 20% matching funds requirement (in-kind contributions, i.e., donated goods and services, are permissible) or obtain a waiver of this requirement**
- **Meet financial and administrative requirements, and**
- **Prepare a plan to use technical assistance based on EPA's technical work schedule.**

For more information call Fraser Felter at (415) 744-2181.

During 1993, EPA will initiate work on a vadose zone FS to examine ways to protect the groundwater from contaminants that could reach the groundwater in the future. This FS will review and evaluate options for cleanup of VOC contamination in the vadose zone of the San Fernando Valley.

EPA will continue to gather and analyze information important to the project. EPA will also continue to work with the San Fernando Valley water purveyors and the Upper Los Angeles River Area (ULARA) Watermaster to summarize past and future groundwater management in the San Fernando Valley, including an overall water balance for the San Fernando Valley. EPA's interim actions to remove contaminants and inhibit migration from the most contaminated areas in North Hollywood, Burbank, Glendale North, Glendale South and Pollock OUs will also provide information useful for the basinwide FS. The quarterly groundwater monitoring program results, which include updated groundwater plume maps, will be available semi-annually at the five information repositories listed on page 11.

EPA will also continue to hold quarterly management committee meetings. These meetings, typically conducted in the Los Angeles area, are held among EPA, state and local agencies, the San Fernando Valley water purveyors, and the ULARA Watermaster to discuss the current status and future plans regarding EPA's Superfund activities in the San Fernando Valley.

As a result of repeated detection of only very low levels of PCE in the Verdugo Basin, EPA intends to continue to monitor the groundwater quality of that basin for at least the next five years.

Does EPA Consider Other Environmental Requirements?

Remedial actions must comply with all substantive elements of federal laws and more stringent state laws that apply or are determined to be relevant and appropriate to the remedy. EPA refers to these requirements as Applicable or Relevant and Appropriate Requirements (ARARs). Although several interim remedies (i.e., OUs) are currently operating or planned, a final cleanup remedy for the San Fernando Valley Superfund Site has not yet been selected. The ARARs identified in the RI are preliminary. When specific cleanup options are developed, EPA will consult with other federal and state agencies to identify the specific requirements. A final determination of requirements will be made by EPA and will be included in the Feasibility Study.

Glossary

ADMINISTRATIVE RECORD
The collection of documents which form the basis for an agency's decision on the selection of a response action at a Superfund site. **CERCLA** requires the EPA to establish an administrative record for every Superfund response action and to make a copy of the administrative record available at or near the site.

APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARs)
Remedial actions must comply with all substantive elements of Federal laws and more stringent state laws that apply or are determined to be relevant and appropriate to the remedy.

CERCLA
see Superfund.

CLUSTER WELLS
A group of two to four wells installed in close proximity to one another to sample groundwater at different depths.

GROUNDWATER
Underground water that fills pores between particles of soil, sand, and gravel or openings in rocks to the point of saturation. Where groundwater occurs in significant quantity, it can be used as a source of water supply.

NATIONAL PRIORITIES LIST (NPL)
A list of the top-priority hazardous waste sites in the country that are eligible for investigation and cleanup under the Superfund program.

OPERABLE UNIT (OU)
A distinct action taken at a Superfund site that contributes to the permanent

Continued on page 10

Glossary *Continued from page 9*

site cleanup. A number of operable units can be taken in the course of a Superfund project.

PARTS PER BILLION (PPB)
Units commonly used to express low concentrations of contaminants. For example, 1 ounce of trichloroethylene (TCE) in 1 billion ounces of water is 1 ppb.

PERCHLOROETHYLENE (PCE)
Also called tetrachloroethylene. A nonflammable solvent used commonly in dry cleaning operations and to remove grease from equipment. It is a suspected carcinogen.

PLUME
A three-dimensional zone within the groundwater containing contaminants that generally move in the direction of, and with groundwater flow.

PRODUCTION WELL
A well that pumps water out of the ground to provide a municipal, agricultural, or industrial water supply.

RECORD OF DECISION (ROD)
A public document that explains the cleanup alternatives to be used at National Priorities List sites. The Record of Decision is based on information and technical analysis included in the administrative record including data generated during the remedial investigation/feasibility study and consideration of public comments and community concerns.

REMEDIAL ACTION
The construction or implementation of the selected cleanup remedy for a Superfund site.

REMEDIAL INVESTIGATION/FEASIBILITY STUDY (RI/FS)
A two-part study of a hazardous waste site that must be completed before the site remedy is chosen and implemented. The first part, the Remedial Investigation, examines the nature and extent of contamination. The second part, the Feasibility Study, identifies and evaluates alternatives for addressing site contamination.

RISK ASSESSMENT
An evaluation performed as part of the remedial investigation to assess conditions at a Superfund site and determine the risk posed to public health and/or the environment.

SAN FERNANDO VALLEY
Geographic area composed of the valley floor and four groundwater basins: the San Fernando Basin, the Verdugo Basin, the Sylmar Basin, and the Eagle Rock Basin.

SAN FERNANDO VALLEY STUDY AREA
The eastern portion of the San Fernando Valley that includes the eastern portion of the San Fernando Basin and the entire Verdugo Basin.

SUPERFUND
The common name used for the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act (SARA), which defined a cleanup process and authorized money for investigating and cleaning up the nation's worst hazardous waste sites.

TETRACHLOROETHYLENE
see Perchloroethylene.

TRICHLOROETHYLENE (TCE)
A nonflammable liquid used commonly as a solvent to remove grease from metal. It is a suspected carcinogen.

VADOSE ZONE
The area between the ground surface and the water table. Also called the unsaturated zone.

VERTICAL PROFILE BORINGS (VPBs)
Wells drilled into the shallow groundwater to define the extent of groundwater contamination.

VOLATILE ORGANIC COMPOUND (VOC)
An organic compound (carbon containing) that evaporates (volatilizes) readily at room temperature.

SAN FERNANDO VALLEY INFORMATION REPOSITORIES

EPA encourages you to review the Basinwide Remedial Investigation Report (December 1992). The report and other San Fernando Superfund documents are available for public review at the following five locations. If the copies are not available, contact Fraser Felter, Community Relations Coordinator, at (415) 744-2181.

City of Burbank Public Library
110 North Glenoaks Boulevard
Burbank, CA 91502
(818) 953-9741
Contact: Andrea Anzalone
Hours: M–Th9:30 am–9:00 pm
F 9:30 am–6:00 pm
Sat 10:00 am–6:00 pm

City of Glendale Public Library
222 East Harvard Street
Glendale, CA 91205
(818) 548-2021
Contact: Lois Brown
Hours: M–Th10:00 am–8:55 pm
F–Sat 10:00 am–5:55 pm

California State University Northridge Library
18111 Nordhoff Street
Northridge, CA 91330
(818) 885-2285
Contact: Mary Finley
Hours: M–Th 8:00 am–10:00 pm
F 8:00 am–5:00 pm
Sat 9:00 am–5:00 pm

Los Angeles Department of Water and Power (LADWP) Library
111 North Hope Street, Room 518
Los Angeles, CA 90012
(213) 481-4612
Contact: Joyce Purcell
Hours: M–F 7:30 am–5:30 pm

The University Research Library/U.C.L.A.
Public Affairs Service
405 Hilgard Avenue
Los Angeles, CA 90024
(310) 825-4003
Contact: Barbara Silvernail
Hours: M–F 10:00 am–7:00 pm
Sat 1:00 pm–5:00 pm

For further information about the Basinwide investigation and cleanup, contact:

Kevin Mayer/Project Manager
U.S. EPA, Region IX
75 Hawthorne Street (H-6-4)
San Francisco, CA 94105
(415) 744-2260

Fraser Felter/Community Relations Coordinator
U.S. EPA, Region IX
75 Hawthorne Street (H-1-1)
San Francisco, CA 94105
(415) 744-2181 or (800) 231-3075

MAILING LIST COUPON

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What is Superfund?

Superfund is the commonly-used name for the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), a federal law enacted in 1980 and amended in 1986. CERCLA enables EPA to respond to hazardous sites that threaten public health and the environment where owners or operators are either unwilling or unable to address the contamination themselves.

Two major steps in the Superfund process are to conduct an in-depth investigation of a site (called a Remedial Investigation) and evaluate possible cleanup alternatives (the Feasibility Study). During the Remedial Investigation, information is gathered to determine the general nature, extent, and sources of contamination at a site. Using the alternatives developed during the Feasibility Study, EPA selects a preferred cleanup alternative considering the following criteria: (1) overall protection of human health and the environment; (2) compliance with state and federal laws; (3) long-term effectiveness; (4) reduction of potency of the contamination (toxicity), ability of the contaminants to move through the environment (mobility), and the amount of contamination (volume); (5) cost; (6) short-term effectiveness; (7) how easily an alternative can be applied (implementability); (8) state acceptance; and (9) community acceptance.

Once the final cleanup plan has been selected, EPA formalizes this decision by signing a Record of Decision (ROD). The ROD also contains a Responsiveness Summary, EPA's response to public comments. Design and actual cleanup activities (Remedial Design and Remedial Action) can then proceed.

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